

Claims:

1. A shear thinning ethylene/ $\alpha$ -olefin  
interpolymer, the interpolymer having polymerized therein  
ethylene, at least one  $\alpha$ -olefin monomer and, optionally,  
5 at least one diene monomer and being characterized by a  
Processing Rheology Ratio (PRR) of at least four, where  
PRR = (interpolymer Viscosity measured at 190°C with a  
shear rate of 0.1 rad/sec)/(interpolymer Viscosity  
measured at 190°C with a shear rate of 100 rad/sec) +  
10 [3.82 - interpolymer Mooney Viscosity (ML<sub>1+4</sub>@ 125°C)] x  
0.3.

2. The interpolymer of Claim 1, wherein the  
interpolymer has (a) a weight ratio of ethylene to  $\alpha$ -  
olefin within a range of from 90:10 to 10:90, the  $\alpha$ -  
15 olefin being a C<sub>3-20</sub>  $\alpha$ -olefin and (b) a diene monomer  
content within a range of from 0 to 25 percent by weight,  
based on interpolymer weight.

3. The interpolymer of Claim 1, wherein the  
interpolymer has a Mooney Viscosity (ML<sub>1+4</sub> at 125°C) within  
20 a range of from 0.5 to about 200.

4. The interpolymer of Claim 1, wherein the  
interpolymer has a molecular weight distribution (Mw/Mn)  
of at least 2.0.

5. The interpolymer of Claim 4, wherein the  
25 molecular weight distribution is at least 2.5 and the PRR  
is at least 8.

6. The interpolymer of Claim 1, wherein the  
interpolymer is an EAODM interpolymer with a molecular  
weight distribution of at least 2.3, a Mooney Viscosity  
30 (ML<sub>1+4</sub> at 125°C) of at least 15 and a PRR of at least 20.

7. The interpolymers of Claim 1, wherein the interpolymers are ethylene/octene-1 copolymers with a molecular weight distribution of at least 2.3, a Mooney Viscosity ( $ML_{1+4}$  at 125°C) of at least 5.

5           8. The interpolymers of Claim 2, wherein the  $\alpha$ -olefin is selected from the group consisting of propylene, butene-1, pentene-1, 4-methyl-pentene-1, hexene-1, octene-1, styrene, p-methyl styrene and mixtures thereof, and the optional diene monomer is  
10 selected from the group consisting of 5-ethylidene-2-norbornene, 5-vinylidene-2-norbornene, 5-methylene-2-norbornene, 1,4-hexadiene, 1,3-pentadiene, 7-methyl-1,6-octadiene, 1,3-butadiene, 4-methyl-1,3-pentadiene, 5-methyl-1,4-hexadiene, 6-methyl-1,5-heptadiene and  
15 mixtures thereof.

          9. The interpolymers of Claim 2, further comprising a PRR enhancing amount of an additional diene monomer, the additional diene monomer being selected from the group consisting of dicyclopentadiene, norbornadiene,  
20 1,7-octadiene, and 1,9-decadiene.

          10. A process for preparing ethylene/ $\alpha$ -olefin interpolymers of Claim 1, the process comprising:  
contacting ethylene, at least one  $\alpha$ -olefin monomer and, optionally, at least one diene monomer with a catalyst  
25 and an activating cocatalyst under conditions sufficient to attain an ethylene conversion of at least 60 weight percent, the conditions including a temperature of at least 70°C and, optionally, in the presence of an effective amount of hydrogen, the amount being sufficient  
30 to maintain an interpolymers PRR of at least 4, the catalyst being a constrained geometry metal complex

          11. The process of Claim 10, wherein the amount of hydrogen is greater than 0 mole percent, but less than

0.10 mole percent, based upon total monomer content plus hydrogen content.

12. The process of Claim 10, wherein the amount of hydrogen is greater than 0 mole percent, but less than 0.05 mole percent, based upon total monomer content plus hydrogen content.

13. The process of Claim 10, wherein the catalyst is selected from the group consisting of (t-butyl-amido)-dimethyl( $\eta^5$ -2-methyl-s-indacen-1-yl)silane-titanium (IV) dimethyl, (t-butylamido)-dimethyl-( $\eta^5$ -2-methyl-s-indacen-1-yl)silane-titanium (II) 1,3-pentadiene and (t-butylamido)dimethyl-( $\eta^5$ -2-methyl-s-indacen-1-yl)silane-titanium (II) 2,4-hexadiene or a Group B catalyst selected from (t-butylamido)-dimethyl( $\eta^5$ -2,3-dimethylindenyl)silane-titanium (II) 1,4-diphenyl-1,3-butadiene, (t-butyl-amido)-dimethyl( $\eta^5$ -2,3-dimethyl-s-indacen-1-yl)silane-titanium (IV) dimethyl and mixtures thereof.

14. The process of Claim 10, wherein the activating cocatalyst is trispentafluorophenyl borane.

15. The process of Claim 10, wherein the interpolpolymer has an ethylene content of from 20 to 95 weight percent (wt%), an  $\alpha$ -olefin content of from 80 to 5 wt%, the  $\alpha$ -olefin being a  $C_{3-20}$   $\alpha$ -olefin and, optionally a diene monomer content within a range of from 0 to 25 percent by weight, all percentages based on interpolpolymer weight and totaling 100 wt%.

16. The process of Claim 10, wherein the interpolpolymer is amorphous.

17. The process of Claim 10, wherein the interpolpolymer is at least partially crystalline and the

temperature is at least 80°C and the ethylene conversion is at least 80%.

18. An article of manufacture having at least one portion thereof fabricated from a composition that  
5 comprises the interpolymer of Claim 1.

19. The article of claim 18, wherein the article is selected from the group consisting of wire and cable components, electrical insulation, belts, hoses, tubes, gaskets, membranes, molded goods, extruded parts,  
10 automotive parts, adhesives, tire walls and tires.

20. The article of Claim 18, wherein the composition further comprises at least one additive selected from the group consisting of fillers, fibers, plasticizers, oils, colorants, stabilizers, foaming  
15 agents, retarders, accelerators, and cross-linking agents.

21. An polymer blend composition, the composition comprising more than 50 parts by weight of a crystalline polyolefin resin and less than 50 parts by weight of the interpolymer of Claim 1, the total amount of crystalline  
20 polyolefin resin and interpolymer being 100 parts by weight.

22. A thermoplastic vulcanizate composition, the composition comprising from 60 to less than 10 parts by  
25 weight of a crystalline polyolefin resin and from 40 to more than 90 parts by weight of the interpolymer of Claim 1 wherein the interpolymer is at least partially cross-linked such that the composition has a gel content of at least 70 %, based on interpolymer weight, the total  
30 amount of crystalline polyolefin resin and interpolymer being 100 parts by weight.

23. The composition of Claim 21 or 22, wherein the crystalline polyolefin resin is a polypropylene homopolymer, a copolymer of propylene with an  $\alpha$ -olefin selected from the group consisting of ethylene, 1-butene,  
5 1-pentene, 1-hexene, 1-octene, 2-methyl-1-propene or 4-methyl-1-pentene, or a blend of a polypropylene homopolymer and a propylene/ $\alpha$ -olefin copolymer or a mixture thereof.

24. The composition of Claim 23, wherein the  $\alpha$ -  
10 olefin is ethylene.

25. An article of manufacture fabricated from the composition of any of Claims 21-24.